DOCUMENT RESUME

ED 321 003 CE 051 377

AUTHOR Stockdill, Stacey Hueftle
TITLE The Technology for Literacy Project Evaluation Report.
SPONS AGENCY Saint Paul Foundation, St. Paul, MN.
PUB DATE Aug 88
NOTE 47p.; For a related document, see ED 295 028. Presented to the Donor Review Board.
PUB TYPE Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Adult Basic Education; *Basic Skills; Case Studies; *Computer Assisted Instruction; Educational Research; *Educational Technology; Incentive Grants; Inservice Teacher Education; *Outcomes of Education; *Program Effectiveness
IDENTIFIERS Saint Paul Public Schools MN; *Technology for Literacy Project

ABSTRACT

The Technology for Literacy Project was a three-year experimental project to explore the use of computers and other forms of technology with adults lacking basic skills in reading, writing, and mathematics. The project, which concentrated on St. Paul, Minnesota, and its surrounding counties, had four components: direct service, incentive grants, training, and research. The project provided technology-based basic skills instruction to 2,494 adult learners (which was 192 percent over initial projections). Over its three years of operation, the program's retention rate increased from 56 to 64 percent. The goal of the project's incentive grant program was to stimulate the use of technology by other existing literacy programs. Toward that end, a total of 14 grants were awarded in four Minnesota counties. The grants were used to purchase hardware and software and to provide training to teachers and staff. The program's training component focused on increasing the use of technology-assisted instruction and facilitating cooperative efforts in technology by training adult basic education instructors in the use of educational technology. The training program included internships, workshops, and conference presentations. The project's research phase resulted in a monograph and various articles on the project's implementation and outcomes. (MN)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED321083

Evaluation Report

Regarding:
The Technology for Literacy Project

Presented to:
The Donor Review Board

by
Stacey Hueftle Stockdill, Ph. D.

August, 1988

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.

☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

SH Stockdill

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

CE051377

BEST COPY AVAILABLE

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY:	
INTRODUCTION:	1
DIRECT SERVICE:	2
Recruitment	2
Achievement	3
Standardized Test Results	4
Mastery Test Results	4
Other Indicators of Success	6
Qualitative Indicators of Success	6
Retention	7
Summary	10
INCENTIVE GRANTS:	12
1986 Incentive Grants	13
1987 Incentive Grants	19
Strengths, Weaknesses, & Issues	23
TRAINING:	24
Internships	24
Workshops/Conferences	24
Other Indicators of Impact	30
Dissemination	30
Summary	30
RESEARCH:	31
THE TECHNOLOGY FOR LITERACY PROJECT: Conclusions	32
APPENDIX A: Case Studies	36

EXECUTIVE SUMMARY

The Technology for Literacy Project has completed the final year of its original three year grant. This experimental project sought to explore the use of computers and other forms of technology, an approach traditionally avoided, with adults lacking basic skills in reading, writing, and mathematics. It had been believed that such adults would be intimidated by technology and that computer assisted instruction would be too costly. The project had four components: Direct Service, Incentive Grants, Training, and Research. This evaluation report provides information regarding the full three years of operation, relates factors that promoted or limited success, and identifies unintended impacts that can be attributed to the project.

Direct Service

Direct service was to be provided to adults in need of basic skills instruction through a demonstration center, The Technology for Literacy Center (TLC). The recruitment goal was 1300 adults residing or working in Ramsey, Washington, and Dakota counties who were 18 years old or older, had basic skills below the 8th grade level, had not completed high school, had not previously sought help, had not been satisfied with prior educational instruction, and/or wanted to further their education. TLC served 2,494 learners, an accomplishment 192% over projections. TLC attracted the target population; the majority of the learners had skills at or below the 8th grade and had not completed high school while one third had not previously sought assistance. The learner population was unlike the expectations of many in that a large percentage were employed, not on public assistance, from diverse cultural backgrounds, and male. This information contributes to our understanding of illiteracy and illustrates that functional illiteracy cuts across all cultural and socio-economic boundaries.

The Technology for Literacy Center intended to study whether using technology would detract from or facilitate progress by adult learners. Data collected through standardized tests, criterion-referenced tests, GED certification, and exit interviews shows that the majority of the learners enrolled for more than 12 hours made progress toward their goals. Participants reported being "very satisfied" with their studies at TLC. Believing they were learning, they credited the computers, the teachers/tutors/staff, being able to work at their own pace, and the curriculum with their progress. Comments attributed success to: "The patience of staff. They answer my questions even if I feel they are unimportant." ". . . learning structured in segments or learning units because it seems to give direction and a sense of accomplishment." ". . . the computers. . . when I don't understand, the computer has a place where I can push a button and it will review the lesson. I don't have to tell anyone I don't understand."

Over the years, learners could identify very few factors they did not like about TLC. In the most recent survey, 82% did not respond to the question, answered "Nothing," or stated "I like everything." Only a small number could offer suggestions for improving TLC: as, assign more homework or an additional tutor, have a day care center, have more classes, and provide specific materials. Learners again requested that TLCs be opened in other areas of the city.

TLC was charged with retaining adults who made an initial commitment. There was concern that the computers may be a contributing factor to adults leaving the program, but instead, the data indicates that "adult problems" interfered most with student progress. About one third left because they moved or their phones were disconnected, which may also be an indicator of movement. The high percentage of employed learners also influenced the attrition statistics; many were working two and sometimes three jobs and found that fatigue or the strain of juggling work schedules limited their ability to maintain steady progress with their studies. Over the three years, the retention rate has risen from from 56% to 64%.

TLC has successfully met its recruitment goals, can document that learners made progress, and has improved the retention rate of learners who made a commitment to an educational goal.

Incentive Grants

The Technology for Literacy Project was to stimulate the use of technology by other existing literacy programs. To that end, grants were awarded to literacy programs in Ramsey, Washington, Dakota, and Hennepin counties. These funds could be used to purchase hardware and software and to provide training to teachers and staff. Six grants were awarded in the fall of 1986 and eight grants in the fall of 1987.

Generally, the 1986 projects have carried out proposed activities as planned and have realized significant programmatic changes as the result of the infusion of technology into their programs. Initial site visits uncovered a general excitement coupled with skepticism that computers would be used to any great extent. Early reports from project directors lamented the resistance to use of the computers by instructors; however, at the end of the grant period teachers were enthusiastically extolling the merits of computer/technology use with literacy students and looking for ways additional funds could be obtained for expanded access to hardware and software. At a number of sites, students were so anxious to use the computers that time limits had to be set up so that all learners could have access.

Still, some teachers and tutors remain who have not used the technology or have used it on a limited basis only. Factors which contributed to limited use appear to be: the hours the computer lab was open did not coincide with tutoring sessions; contract and inservice resources limited the paid time available to preview and plan how to use the software; initial experiences with the computer were frustrating; and, at one site, the use was below projections possibly because of the location of the computers in the High School and limited hours of access.

Comments from staff and teachers of Incentive Grant programs further substantiated the value, already documented by TLC, of using technology with adults. They believed the use of computers helped students in areas of motivation, self esteem, skill building, concentration, and following directions. Teachers from three sites reported that the use of computers in the literacy programs gave students skills in common with their children, thus earning them status. The projects had as part of their clientele, persons for whom English is a second language, the learning disabled, and physically and mentally handicapped adults. Their experiences have given credence to the use of technology with a variety of adult groups.

Significant unintended outcomes for the 1986 Incentive Grant programs included: 1) increased capacity to monitor student progress, 2) decreased administration time required to compile statistics requested by funders through the development of student data bases, 3) fund raising skills, 4) acquisition of additional funds for computer assisted instruction, 5) validation of the Adult Basic Education programs as legitimate and important parts of school districts, and 6) expansion of networking among literacy programs.

The eight 1987 projects are at early stages of implementation. All are fully operational; hardware has been installed in programs where that was a goal and software preview is an ongoing activity. The first interim reports reflected frustrations similar to those identified by the 1986 recipients during early stages of implementation. Progress has been slowed by delays in obtaining hardware, shortage of time to adequately preview software and integrate it into existing curricula, part-time staff with limited time available to participate in training, and poor technical support by some hardware vendors.

One major factor promoting success of the Incentive Grants was the inclusion of inservice into the provisions for funding. Project staff often lacked the technical expertise to assess their technology needs accurately, but consultations with TLC staff enabled them to make better decisions.

It was hoped that standardized and mastery tests could be used to study the relationship between computers and achievement. Upon visiting the projects, however, it was learned that there was no standardization in data collection practices. Because the grants were small, it was deemed inappropriate to request that testing information be collected beyond what currently existed. Consequently, there was no statistical way to correlate the hours per grade level change or to document any impact the use of technology had on learner achievement.

One stated goal of the Incentive Grant program was to replicate the Technology for Literacy Center model; however, the advisory committee decided that did not mean exact replicas of TLC. The data indicates that the projects have or are beginning to use technology successfully with adult literacy students in their own unique ways. Evaluation of the Incentive Grant approach indicated factors that are critical to the successful adoption of technology: 1) programs must be able to access hardware, 2) programs need funds for software, 3) stipends for staff training and release time are critical, 4) technical assistance must be provided, and 5) worthy programs should be funded and allowed to adapt technology as they see fit.

Training

The training component was to increase the use of technology assisted instruction in existing literacy programs by informing basic skills instructors on the use of technology, to facilitate cooperative efforts in technology assisted instruction among literacy providers by providing training, and to disseminate TLC materials. TLC has been successful in meeting these goals. Nine persons served internships; four TLC teachers received ABE certification; 2700 literacy providers were reached through workshops and conference presentations; over 1,600 copies of The Technology for Literacy Project Evaluation, the Adult Literacy and Computers Conference Proceedings, and the annotated software bibliography have been disseminated.

The internships, though fewer than projected, were more extensive than originally planned and led to significant outcomes for the interns. For three, the TLC experience led to employment; one used the knowledge gained to integrate technology into the literacy program for which she works; another received helpful advice from TLC when starting a new technology literacy program; a fifth remained active as a volunteer tutor for TLC students.

State-wide trainings, developed by TLC and funded by the Gannett Foundation, were evaluated positively by participants who indicated the workshops led to their using technology for the first time or to their using it in new ways. The materials were seen as applicable to their situations. Many, having heard that TLC might copyright the curriculum and make it available to other programs, offered encouragement to do so. The workshops were reported to have given participants confidence to use what was available, confidence in knowing what materials to use or preview, awareness of resources that were not being utilized, and enthusiasm for computers. Many respondents expressed concern that TLC may not be involved in training in the future and wanted others to know that training in the use of technology is a primary need for the literacy field. Interviewees, however, were aware that the training functions had greatly increased the stress and work load of the TLC staff and believed that training could be undertaken in the future only if additional staff were hired.

Research

The research component of the original proposal called for study of the value and applicability of technology in basic literacy instruction and dissemination of the results. A Master's thesis, using the TLC student data base, is in its final editing stages. Six articles have been published in professional journals. The Educational Research Information Clearinghouse (ERIC) has requested the The Technology for Literacy Project Evaluation monograph, assuring access to anyone who wishes. Dr. Turner and Dr. Stockdill have been asked by the Adult Literacy & Technology project to write handbooks on the design of adult literacy and technology centers and the evaluation of literacy programs, to be made available to literacy projects nationwide. The intended goals of the research component have been accomplished.

Conclusions

Staff, board members, and nationally recognized literacy specialists identified factors that contributed to the success of the Technology for Literacy Project. They included: 1) the careful planning that went into the project design, 2) the commitment and sensitivity to the target population, 3) the application of contemporary research in combination with contemporary technology, 4) the active involvement of the Saint Paul Public Schools and Community Education Advisory Board, 5) the primary focus on direct service which enabled the training and incentive grants to be grounded in practice, 6) the location which made TLC accessible to the people who were most in need of help, 7) the role of the Saint Paul Foundation in planning, administering, and monitoring the project, 8) the evaluation which had a purposeful impact on the program and the program's direction, and 9) the TLC staff and Center Manager who continue to struggle on a daily basis with making the educational program meaningful and accountable.

Board members were concerned about future funding and TLC's continuation. One wanted TLC to explore involving its graduates in direct service so that capacity building for the community would occur. Another was concerned with attrition, although was unsure what TLC could do because some responsibility also rests with the clients. Staff are concerned about the unique challenges the increased enrollment of handicapped persons bring to the program. Staff will continue to strengthen the lab setting with alternative group instructional models.

TLC's role in the continued training of literacy providers in the use of technology with adults was discussed repeatedly. Some funders were concerned that if the TLC approach to the literacy issue is valid, then similar centers should be started or ways should be found to disseminate the learnings from TLC to the larger literacy audience. Literacy specialists and providers were concerned that the field of literacy will lose a valuable trainer if TLC does not continue those activities as part of their mission. Literacy providers also want access to the TLC curriculum. However, because of the additional stress and work, TLC staff are inclined to want the training function phased out. One board member suggested the training function be undertaken by the Minnesota Adult Literacy Campaign. Another reported, "I think one of the things we don't want to fail on is really promoting this. . . I think you have to market it. . . You may have to have an invitational seminar or be invited to other seminars. Maybe some money has to be set aside. . . Maybe some national convention and some national promotion and fund raising ought to come out of this. Maybe it has to be a special staff set aside [to do this]."

The evidence shows that the Technology for Literacy Project has had a major impact on the field of literacy, the field of adult education, the field of evaluation, grant making processes, and the Saint Paul Public Schools and, while educating about the issue of illiteracy, has made the dreams of many of its learners come true.

INTRODUCTION

In 1983, the F. R. Bigelow Foundation commissioned Dr. Terilyn C. Turner, in cooperation with Jean E. Hart, to explore the feasibility of using technology to address the literacy issue in Ramsey, Washington, and Dakota counties. The resulting document, the Technology Assisted Literacy Project, envisioned the development of a literacy center located in a shopping mall utilizing computers and other technologies to help adults who lacked basic skills. The F. R. Bigelow Foundation, Cowles Media Foundation, Mardag Foundation, Northwest Area Foundation, The St. Paul Companies, Inc., and The Saint Paul Foundation, in cooperation with the Saint Paul Public Schools, initiated a three year community based program, The Technology for Literacy Project. The project has four major components:

- Direct service to adults in need of basic skills instruction through a demonstration model incorporating education assisted by technology.
- Training of teachers, administrators, graduate students, and volunteers to enable them to incorporate technology into their programs.
- Incentive Grants to stimulate the use of technology in other existing literacy programs.
- Research and dissemination of the results regarding the value and applicability of technology in basic literacy instruction.

The Technology for Literacy Project has completed the final year of its three year experimental phase. This evaluation report will: 1) provide information to funders, project staff, and external audiences regarding the full three years of operation, and 2) identify unintended impacts which have occurred as a result of project activities. Information was collected through student records; student, staff, instructor, and volunteer questionnaires; project documents; and interviews with project staff, funders, school administrators, workshop participants, students, and literacy experts outside the Technology for Literacy Project.

DIRECT SERVICE

The Technology for Literacy Project proposal identified three major goals for the direct service component, the Technology for Literacy Center (TLC): the center was to recruit 1300 adults, employ technology to aid literacy achievement of those adults, and retain participants for a significant period of time.

Recruitment:

The recruitment goal stated: TLC will attract 1300 adults residing or working in Ramsey, Washington, and Dakota counties who are 18 years old or older, have basic skills below the 8th grade level, have not completed high school, have not previously sought help, have not been satisfied with prior educational instruction, and/or who want to further their education.

Over the past three years, TLC worked with 2,494 learners. This is 192% over projections (See Table 1). Of the learners served in year three, 139 were continuing their studies from the first program year (1985-1986) and 186 had enrolled in the second school year (1986-1987). As can be seen, the number of learners recruited in the second year of operation was not maintained during the third year; however, these fewer students were given 25% more instructional hours.

Table 1
TLC Recruitment

Year	Goal:	Number Served	Percent Above Projections	Hours of Instruction
Year I (6/1/85-5/30/86)	**300**	**798**	**266%**	**15,979**
Year II (6/1/86-5/30/87)	**500**	**909**	**185%**	**16,019**
Year III (6/1/87-5/30/88)	**500**	**787**	**157%**	**20,193**
Totals	**1300**	**2494**	**192%**	

TLC recruited the target population (See Table 2). The majority of learners served have skills at or below the 8th grade as measured on a standardized test and have not completed high school. However, over the three years there has been a decreasing number of learners who have not previously sought assistance.

Table 2
Learner Demographics

	Year I	Year II	Year III
Number Served	**798**	**909**	**787**
Target Population:		**(Percent of Total)**	
Adults who:			
* Have basic skills at or below 8th grade	75%	74%	70%
* Have not completed high school:			
o 0-8th grade	15%	14%	15%
o 9th - 11th grade	39%	40%	43%
o Graduates	40%	42%	38%
* Have not previously sought assistance	46%	40%	31%

The demographics of the learners served by TLC has not changed significantly over the past three years (See Table 3). During the first year of operation, there was surprise at the number of learners who were employed as other programs did not report as high a percentage. The expectation was that only unemployed would seek out literacy services, however, the flexibility in hours allowed students to work while attending TLC. They often found the hours of operation of other programs were inconvenient or that special evening classes were oversubscribed.

Table 3
Learner Demographics

	Year I	Year II	Year III
Number Served	**798**	**909**	**787**
Demographics:		**(Percent of Total)**	
* Minority	51%	47%	49%
* Employed	44%	46%	46%
* On Public Assistance	41%	40%	40%
* English is second language	13%	11%	13%
* Female	50%	47%	47%

Achievement:

The primary purpose of the Technology for Literacy Center is to improve the skills of functionally illiterate adults by adding technology to existing methodologies. Student progress

was assessed through standardized achievement tests, mastery tests, and qualitative indicators of success.

Standardized Test Results: In the summative evaluation, changes in grade levels and hours required for one grade level change were used as primary indicators of success because they were the indicators used consistently in adult basic education programs. The conclusion was that "TLC is 'in the ballpark' with other nationally recognized programs on reading achievement and that the hours per grade level change at TLC are substantially lower than time-on-task achievement norms from the published literature for adult literacy programs" (Turner and Stockdill, 1987). Because in that special study attempts were made to posttest all learners in the summative group, it would not be accurate to compare that group with the data collected over the past two and one half years. Some of the most successful students, such as GED graduates, do not return for posttests. Hours per grade level change is not a methodologically sound criteria; measurement and testing specialists would not recommend its use as a reliable or valid criteria. Dr. Michael Patton, summative evaluator, recommended that TLC explore other criteria. To that end, TLC is using the standardized test to demonstrate that students skills do change with treatment but are not correlating the amount of change with hours.

Statistical significance tests were used to determine if there was a difference between pretest and posttest means. The analyses show that all change between pre and post test was in a positive direction and statistically significant (See Table 4).

Table 4
Pretest to Posttest Gain Score Comparisons
(January 1, 1986 to June 1, 1988)

	Pretest Mean	Posttest Mean	Mean Grade Level Gain	t-value (One-tailed t test)
Reading (213 Learners)				
* Comprehension	5.93	6.77	.84	8.88**
* Vocabulary	5.90	6.56	.66	8.68**
* Composite	5.82	6.55	.73	11.59**
Math (81 Learners)				
* Computation	6.65	7.84	1.19	8.50**
* Concepts/ Problems	6.69	7.47	.78	6.00**
* Composite	6.63	7.64	1.01	10.07**

(**significant at alpha $\leq$ .01)

Mastery Test Results: There was concern that the standardized test, while allowing for comparisons with other programs, might not accurately assess the degree to which learners mastered the material. Criterion-referenced tests were developed by project staff to assess the degree to which learners met learning objectives. These were implemented after March of 1986 when the project had a standardized curriculum (See Table 5). There are programmatic reasons for the differences noted. Additional courses have been made available to students in Year III. The reading courses have been expanded to include additional lessons so that learners take longer to complete a module than in Years I and II. This accounts for the apparent differences in the number of modules mastered in the third year.

Table 5
Number of Modules Mastered

	Year I	Year II	Year III
	3/86-5/86	6/86-5/87	6/87-5/88
READING			
Basic Reading:			
* Laubach Book 1	6	48	23
* Laubach Book 2	18	39	24
* Laubach Book 3	11	15	20
* Laubach Book 4	0	5	4
Totals:	35	107	71
Independent Reading:			
Totals:	36	68	69
Pre-GED/Practical Reading:			
Totals:	64	105	144
GED Reading:			
Totals:	30	69	20
MATH			
Basic Math:			
Totals:	23	108	87
Pre-GED/Consumer Math:			
Totals:	44	123	117
GED Prep Math:			
Totals:	3	12	4
LANGUAGE			
Spelling I	0	5	10
Spelling II	0	0	10
Fundamentals of English:	0	0	7
GED Writing:	0		7
Total modules mastered:	*	597	546

(* Not computed for the three month period)

Other Indicators of Success: Other data which indicates that learners are making progress follows:

Table 6
Progress Information

	Year I	Year II	Year III
	(Number of Learners)		
* Obtained GED	15	39	27
* Completed all personal goals	14	4	2
* Advanced to another program	4	2	6

Using as evidence standardized tests, mastery tests, GED certification and the like, there is proof that 62% of the learners enrolled for more than 12 hours made progress toward their goals. It should be noted that this percentage includes learners who only recently enrolled in TLC and were still in the intake phase. If these 35 learners are not included in the statistic, the figure rises to 66%. Additional analyses indicated that of the learners who enrolled during the first year who remained active for at least 12 hours in Year III, 70% (57) continued to make progress toward their educational goals. Similarly, 78% (85) of the learners who enrolled during the second year of TLC who remained active for at least 12 hours in Year III made progress toward their goals.

Qualitative Indicators of Success: Periodically, TLC administers questionnaires to learners to identify program strengths and areas of weakness. Previous reports to the board have indicated that learners are happy with their studies; believe they are making progress; like the computers; believe the teachers, tutors, staff, and site are strengths of the program; and generally have few suggestions for program changes. The case studies and comments from group interviews with learners included in the summative evaluation further substantiated these findings and added to knowledge about illiteracy and the impact TLC has had on learners' daily lives. In 1987-1988, questionnaires were again administered; 100 learners responded for a 80% response rate. Learners continue to report that they are "very satisfied" with their studies at TLC (87%) and believe they are learning (79%). On these five point scales, only 3 responses were lower than three. Regarding what had helped their learning most, many learners gave multiple responses. The learners credited the computers (22%), the teachers/tutors/staff (35%), being able to work at their own pace (5%), and the curriculum/materials (18%). Selected comments included:

> "The patience of staff. They answer my questions even if I feel they are unimportant. I need a little attention at times."
>
> "The step by step computer disks that you have on various math and reading."
>
> "The slow steps. By going slower I remember more."
>
> "Learning at your own rate."

"I like the idea of my learning structured in segments or learning units because it seems to give direction and a sense of accomplishment."

"The individual help I receive and the material that is available to me. And getting answers to my questions from the instructors."

Similar responses were given to the question: "What do you like best about TLC?" Additional perspectives included: the Saturday hours, the video tapes, the location, and the atmosphere. Learners appreciated the adult environment. One comment reflected by others was, "The teachers. And, being treated like a responsible adult. Being allowed to set my own hours and days is really nice." Another wrote, "People are kind to one another." Five learners reported being able to set their own schedule as a positive aspect of TLC. One learner wrote, "The way it is set up so I can work at my own pace. I am always asked about choices and how I feel about the subject or what I am doing."

There were 61 learners who did not respond to the question: "What don't you like about TLC?" In addition, 18 said, "Nothing," and three students said, "I like everything." Only ten learners could identify some aspect they did not like. One issue that also was evident in previous questionnaires was getting immediate responses to a question. Learners found that when only one teacher was on the floor or when there were many students, there were delays in getting a teacher to answer a question. Also identified again as aspects students did not like were the need for more private space and the inconvenience of having TLC closed a number of times for meetings. The TLC staff recognizes and is continually working on these issues. A strength of the program is that responses from the questionnaires are used to make program modifications.

Learners were asked: "How can TLC help you better?" Again, there were many students (51) who could not respond or who reported: "You can't." "Keep up your good work and it will help other people as well as myself. " " Stay doing just what they're doing. I feel like I'm making a lot of progress." Suggestions were to assign more homework or an additional tutor, have a day care center, have more classes, and provide specific materials such as a book on mechanics. Two learners wanted more TLCs opened in other areas of the city. One learner recommended using "retirees from business to help in the computer room for extra time for the student when teachers are busy."

To further portray the impact of TLC, five case studies are presented in Appendix A.

Retention:

One TLC goal is to retain adults who have made an initial commitment. In the summative evaluation, Dr. Patton identified a number of conceptual and definitional problems and dilemmas with retention/attrition statistics currently being used in the field of literacy. He recommended that TLC look at participation and nonparticipation rates whereby a nonparticipant would be a learner who does not participate in the program for more than 12 hours. This 12 hour standard has been set by the Federal Department of Education. With that criterion, the following statistics were calculated:

Table 7
Participant/Nonparticipant Data

	Year I	Year II	Year III
TOTAL LEARNERS:	798	909	787
• **Percent Participants** (Learners who spent at least 12 hours in the TLC program)	55%	65%	61%
• **Percent Nonparticipants** (Learners who spent less than 12 hours in the TLC program)	45%	35%	39%

The percentage of learners who continue to participate in the TLC program increased between Years I and II. There was a slight drop in the percentage between Years II and III; however, as was noted previously, the participants in Year III were given 25% more instructional time.

The percentage of nonparticipants for the Metro East Adult Basic Education Consortium programs is 17% to 23%. Differences exist, however, in the way that other programs count learners. Sometimes a group orientation meeting is held and learners who do not return to complete registration are not included in the nonparticipant count. TLC has had an individualized intake process whereby every learner who enters the program is counted. This may contribute to the differences in statistics. TLC has been exploring alternative intake options this past year. There has been concern that the nonparticipants require program resources that could be used in educational programming. One approach tested was to hold a group orientation so that potential learners could examine the program before committing themselves to becoming a student. This process alone would decrease the number of learners in the nonparticipant group. TLC may also be experiencing a higher percentage in this group because of its location and flexibility. It is relatively easy to drop in and out of the TLC program. Time card analysis shows that some learners take advantage of this policy by attending as little as 1 hour each month. A change in policy may not be warranted because the flexibility also benefits the truly motivated learner who has to leave because of life circumstances. TLC may want to set its own standards regarding this figure, and recognize that differences may occur between this program and others because of its uniqueness.

In conversation, Dr. Patton further recommended that the retention/ attrition figures that would most accurately reflect important trends for TLC would be those which included learners who participated in the program for at least 12 hours. With this change in definition, the following retention and attrition statistics were calculated:

Table 8
Retention/Attrition Data

	Year I	Year II	Year III
TOTAL PARTICIPANTS: (Learners who spent at least 12 hours at TLC)	439	592	480
Retention Rates:			
* Percent still active at the end of period	49%	46%	48%
* Percent completions who left the program	7%	12%	16%
* Retention Rates	56%	58%	64%
Attrition Rates:			
* Pending (not seen for 30 days)	18%	18%	12%
* Inactive (no response to call or letter)	26%	24%	24%
* Attrition Rates	44%	42%	36%

There has a been an increase over the three years in the number of completions and the number of learners retained by the program. In addition, the attrition pending percentage indicates that the new tracking procedures instituted in 1988 are helping the program monitor learner attendance more effectively.

It is important to note that classifying a learner as pending or inactive does not mean that that learner has made no progress toward his/her goals. TLC has defined a completion as finishing a course and that may require mastering a number of modules. These course definitions are based, to some degree, upon functional literacy classifications. For example, to be functionally literate at the most basic level it would be expected that the learner should master addition, subtraction, multiplication, and division. Furthermore, to become functionally literate whereby the learner could function in society it would be expected that the learner would need to master fractions, decimals, percentages, and basic measurement concepts. Mastering these modules represents the second major TLC course. In examining the records for those learners who were inactive, it was learned that many, 68(39%), made progress toward their goals but did not complete all course requirements. For example, one learner completed the fractions and decimals modules while spending 83 hours at TLC. This learner is better able to function in society--but is not fully "functionally literate" because she does not know percentage and key measurement concepts. This learner had to leave TLC because she was working two jobs.

TLC monitors the reasons learners leave the program before completing their goals. Additional information is collected, when possible, through exit interviews. During the 1987-1988 school year, sixteen exit interviews were conducted. In all cases, learners reported achieving all or some of their goals. Three received GEDs. Six used TLC to brush up on math and English skills so that they could enroll at TVI, Rasmussen Business College, Minneapolis Community College, and Northeast Metro. The others were unable to continue their studies because of transportation, family illness, or difficulties with work schedules.

Table 9 shows the most common reasons given for nonparticipation or dropping out based on follow-up telephone interviews conducted by TLC program staff or responses to letters sent on a routine basis. These results show that about one third of the learners leave the program because they have moved or that their phone was disconnected which may also be an indicator of movement. The high percentage of employed learners has influenced the attrition statistics. Many of the TLC learners are working two and sometimes three jobs. Many are very proud of their ability to "stay off welfare" but often find that they are just too tired or that juggling work schedules limits their ability to maintain steady progress with their studies. For example, 18% of those active for more than 12 hours left the program because they found work, got a better job, or school conflicted with work. It is significant that 29% of the learners participating less than 12 hours in 1987-1988 had highly irregular attendance. Generally, these learners were in and out of the program repeatedly. Analysis of time cards indicated that some of these learners spent less than one hour each month in the program.

Summary:

The Technology for Literacy Center has not only made into reality the dreams of those who designed the center, it has also made the dreams of many of its learners come true. Progress is slow sometimes, especially for those who come in with the most basic of skills, but generally progress is made if the learner is motivated and personal "adult" problems do not interfere too greatly. TLC's staff continues to struggle on a daily basis with making the educational program meaningful and accountable. They seek out and use evaluation information to help in issue resolution. TLC has successfully met its recruitment goals, can document that learners make progress, and is improving its retention of learners who make a commitment to pursuing an educational goal.

Table 9
Reasons for Leaving TLC

	Nonparticipants (Less than 12 hours)			Drop-Outs (after at least 12 hours)		
	Year I	Year II	Year III	Year I	Year II	Year III
Number	137	150	107	68	100	67
Moved (letter returned)	20%	27%	22%	21%	17%	25%
Phone disconnected	13%	8%	7%	7%	5%	6%
Family problems	9%	2%	3%	6%	1%	3%
Went to another program	8%	5%	4%	13%	4%	7%
Highly irregular attendance	9%	13%	29%	0%	16%	6%
Conflict with work	7%	6%	4%	13%	11%	10%
Health problems	7%	3%	7%	7%	4%	6%
Referred elsewhere	2%	1%	2%	6%	2%	0%
Accepted better job	2%	1%	0%	3%	0%	2%
Transportation	2%	3%	0%	2%	5%	0%
Found a job	2%	3%	2%	2%	4%	6%
Child care	2%	3%	2%	2%	1%	2%
Too busy	2%	2%	5%	2%	4%	10%
Instruction not helpful	2%	4%	1%	0%	5%	3%
Personal problems	0%	5%	0%	0%	2%	0%
TLC not appropriate	1%	3%	0%	3%	2%	0%
Completed some goals	0%	3%	5%	0%	2%	2%
Other	12%	6%*	8%*	15%	13%	12%*

(*Rounding error so does not equal 100%)

INCENTIVE GRANTS

The purposes of the Incentive Grants were to: 1) increase literacy skills of functionally illiterate adults by stimulating the use of technology in local existing literacy programs, 2) replicate technology assisted curriculum and implement educational processes/procedures developed by the center in local existing literacy programs, and 3) expand the research component of the center to include students participating in local existing literacy programs. An advisory committee was established to develop the procedures for awarding grants to literacy programs and to monitor Incentive Grant activities. There were two rounds of funding; six grants were awarded in the fall of 1986 and eight grants in the fall of 1987.

The original intent was to provide funds which projects would use to acquire software/hardware and to train staff. Funds were to be administered through The Saint Paul Foundation, not the Technology for Literacy Center. While identifying selection criteria, discussion turned to TLC's role in assisting the Incentive Grant projects. It was decided that TLC should provide some training in the use of technology for recipients. It was anticipated that Dr. Turner, Center Manager, would visit each site, develop an individualized training plan, and faciliate a mid-year workshop focusing on the final evaluation reporting to funders. Dr. Stockdill, Formative Evaluator, would work individually with recipients to develop appropriate evaluation plans and monitor project activities.

The training and technical assistance provided went beyond original intentions. A preliminary workshop was held to help 1986 grantees understand the conditions of the grant and their evaluation responsibilities and to provide them with introductory materials on technology and its integration into literacy programs. Site visits were then conducted by Drs. Turner and Stockdill to clarify the intentions and assistance needs of the projects. Dr. Stockdill subsequently met with project staffs to develop individual plans and, when needed, data collection instruments. These visits revealed that many of the training needs were consistent throughout the projects; therefore, rather than individual training, another workshop was designed. This workshop addressed the issues surrounding the selection of software and its integration into literacy curricula. Time was given to preview software being utilized at TLC. Project directors and instructors were invited to participate; however, not all were able to do so. TLC also provided a training session for the volunteer tutors of one project.

Drs. Turner and Stockdill believed that it was necessary to monitor Incentive Grant projects closely and provide more technical assistance. For the 1987 grants, Dr. Katherine Wellington was assigned to assist with training and to contact all projects once a month. The 1987 introductory workshop also involved the 1986 participants in order to encourage networking among programs. Dr. Stockdill and/or Dr. Turner and Dr. Wellington visited all the 1987 grant sites. Individual evaluation plans were developed and two additional workshops were provided. All project directors and staff members were invited to attend the second session on the value of technology, ways to preview software, and how to integrate technology into literacy curricula. Both 1986 and 1987 recipients were then invited to attend the state-wide training session hosted by TLC. Additional special training sessions were provided by Dr. Wellington for Survival Skills Institute and the Dakota County Library. Preliminary discussions are being held with Oak Park Heights to develop another training session.

Grant time lines were extended from the traditional one year to 18 months because projects were having difficulty obtaining needed hardware and it was believed that more program impacts could be documented through an extended grant period. The 1986 projects submitted final

reports and the 1987 programs produced interim reports in June 1988. The following information was collected by the evaluator through site visits and interviews with students, teachers, and administrators. In addition, information from the interim and final reports has been synthesized and summarized.

1986 Incentive Grants:

In 1986, these six projects were funded:

- **The Dakota Northwest AB/CE program**, a consortium of community education departments serving Independent School Districts 192, 194, and 196, received $4,300 to initiate computer based instruction at two of the consortium sites and to add more acceptable hardware and software at the third and fourth sites.
- **The Hastings Public Schools, Hastings Laubach Literacy Project,** was awarded $3,776 to help the project introduce technology in both its Laubach and GED tutoring programs.
- **The Learning Disabilities Association, Inc.(LDA),** was awarded $5,000 to purchase hardware and software to enhance the quality of LDA's program by providing supplemental learning materials, promoting independent learning opportunities, and increasing the efficiency of individual educational planning.
- **The Loring Nicollet-Bethlehem Community Center, Inc.** received $4,400 to introduce technological assistance to provide multi-sensory learning experiences for students in the existing Minneapolis Literacy Project and the Adult Basic Education programs.
- **Robbinsdale Area Schools, Community Education and Services,** received $3,500 in matching funds to expand the use of technology in its adult instructional program and to provide related training for its program staff.
- **South St. Paul Public Schools, South Suburban Adult Basic/Continuing Education Consortium,** received $3,500 to incorporate the use of computers in its teaching methodology to enhance its current reading, writing, and math curriculum.

In general, funded projects carried out proposed activities as planned.

The Dakota Northwest Adult Basic and Continuing Education program fully accomplished and documented intended outcomes in their final report. Student use of the computer went from 20 users for 89 hours in 1986 to 179 users for 1371 hours (for six months) in 1987. The program was able to demonstrate that there was: 1) increased participation in the ABE program by low-income, low-literacy adult learners, 2) improvement in adult learners' literacy skills, 3) improvement of staff skills in computer operation and in selection of software, and 4) increased use of the computer for management of student and organizational data.

The Hastings Public Schools, Hastings Laubach Literacy Project experienced some unique frustrations in attempting to integrate technology into their GED and Laubach Literacy programs. There is evidence this did happen, but on a more limited basis than was hoped for. TLC provided technical assistance in the training of Laubach tutors; however, after an initial trial of the computers,

utilization dropped until this group did not utilize the technology resources at all by the end of the 18 month period. The few GED students who did utilize the computers and video technology reported that these methodologies were helpful to their attaining educational goals. Factors which may have affected the adoptation of the technology in this program included the location of the computers and limited access hours. The computers were placed at the High School and it is possible that Laubach learners were concerned that this might be more likely to explose their illiteracy to others in the community. It is also possible that the school building communicated negative associations regarding learning attempts. In addition, the computer lab was available to learners on a limited basis and there may not have been a match between the lab's and learners' schedules. Perhaps volunteer tutors were uncomfortable with the computers or did not fully believe technology to be a useful teaching tool.

The **Learning Disabilities Association** leveraged $10,900 in financial and in-kind support from the Incentive Grant of $5,000. When this project began, a few staff members used computers at home but a large majority were not convinced that computers would be of value for learning disabled students. There has been dramatic growth in this organization's use of technology. A technological component is now integrated into each learner's educational plan. The staff wants more computers and can readily identify ways the computer has helped their learners. Staff members use computers to minimize the time needed to score complicated assessment tests and for administrative tasks.

Loring Nicollet-Bethlehem Community Centers, Inc. has made significant progress in the integration of technology into their program, although this progress has been somewhat slow. This may be attributable to a move to new facilities and change in project directors. Initially there was strong resistance to the use of computers and now nearly all instructors are using the computers in some capacity. A unique factor making the incentives for training critical for this project is that the Minneapolis Adult Education teachers, by union contract, are limited to 13.5 hours of teaching per week and all of that has to be classroom time. According to the project director, a stipend for training has been possible only because of the inservice money written into this grant.

Robbinsdale Area Schools, Community Education and Services: This project was very successful and submitted an exemplary final evaluation report. Instructors, during the first site visit, hoped that the Incentive Grant project would help them utilize the computers available on site more fully and expand their use of video and audio technology. At the end of the project, instructors were using technology as an integral part of the educational program plan for learners. Enthusiasm, generated by the activities surrounding the Incentive Grant, also appears to have encouraged the staff to seek and obtain demonstration site status from two software companies. Robbinsdale has become a recognized leader in the use of technology and receives many requests for assistance from other literacy providers. Robbinsdale used the $3,000 from the Incentive Grant to leverage an additional $11,247.79 in monetary and in-kind contributions.

South St. Paul Public Schools, South Suburban Adult Basic/Continuing Education Consortium submitted an exemplary evaluation report. They documented project activities and outcomes for individual

students as well as for the student body as a whole. Also included was a brief assessment from their staff regarding previous use of technology and the value attached to computer utilization because of the Incentive Grant. They indicated a need for on-going training. This project attempted unique hardware and software configurations which were not totally successful because of hardware limitations; however, those attempts will contribute to knowledge in the field of literacy.

Changes have been apparent during the course of the 1986 Incentive Grant programs. Initial site visits with teachers and administrators uncovered a general excitment coupled with skepticism that computers would be used to any great extent. During early stages of the grants, project directors lamented the resistance to use of the computers by instructors. One director reported: "Although all teachers have had training in the use of word processing, several remain hesitant to attempt their report writing, etc. But with individual assistance, confidence is being built." The tone of the interim reports after 15 months of operations changed for many projects. One project director reported, "All staff are now actively using the computer in their teaching as well as using word processing to write supplementary math word problems." Another said, "Since the initial reporting period when only 50% of the staff were actively pursuing computer assisted instruction for their students, there has been an increase to 85% with the balance seeking assistance for their students but still not feeling comfortable with the computers themselves."

At the end of the grant period, the evaluator interviewed staff and found teachers enthusiastically extolling the merits of computer/technology use with literacy students and wanting to uncover ways additional funds could be obtained for expanded access to hardware and software. At a number of sites, students were so anxious to use the computers that time limits had to be set up so that all learners could have access to the computers. Project directors mentioned that the students were initially more excited about the opportunity to use computers than the teachers/tutors. They also found that, "As teachers see the favorable student response, many of their own uncertainties dissipate and they are encouraged to make maximum use of the computers for instruction and to pursue inservice opportunities." The following comments, from written reports and interviews, illustrate the growth in teachers' attitudes toward the computer and computer skills:

> "I had no previous experience with a computer before this project . . . The computer has been an excellent addition in the classroom for math drill, especially the multiplication tables for the Hmong students. At first they had great fear of the machine, almost as if it were an animal that was going to get them; now they are relaxed and seem to enjoy using it. I can't think of any weeknesses that the computer has, except that we don't always have the software that is needed."

> "I had no previous experience with computers before this project began. Personally, I like using the computer, but I'm not real confident doing things for myself yet. I need more time to practice what I've been taught at the training sessions, to become more comfortable with it. I like to use the computer as a supplement to the curriculum, especially for the basic teachings, although I didn't think that way at first. I can't think of any weeknesses."

> "As a teacher, I am pleased to get the opportunity to use a computer . . . I had never used one before. I am amazed at what it can do!"

> "I would not have had the guts to call up and ask for software from a software company without first learning about the computer. Because of my training through the Incentive Grant, I felt I had something to offer these companies. We now have become a software demonstration site [for two software companies] so that we could expand the small budget we had."

> "I had considerable experience with computers and data bases before, but I did not know what a good educational package looked like. I have a good sense of that now. I have learned how a software package might fit into the curriculum and I am more critical of the software."

> "We have also begun to video tape materials. Last year we video taped some of the career class. We did not have a video tape machine before the grant and now are using it to tape the GED series."

> "[At Courage Center] we have become resources to other units. People come to ask us questions and identify places they can go to get computer materials."

> "It has been exciting that we have been receiving recognition from other literacy programs. They have been coming to see our programs and materials."

There still are teachers and tutors who have not used the technology or have used it only on a limited basis. Sometimes this was because they lacked access to the computers to practice; the hours the computer lab was open did not coincide with their teaching/tutoring sessions; contract and inservice resources limited the paid time available to preview and plan how to use the software in lesson plans; and/or initial experiences with the computer were frustrating. One teacher's comment that represented others heard in interviews follows:

> "I'm reasonably comfortable with the computer, but I haven't taken advantage of what it can do for me. The training I received is adequate, but it is difficult for me to get access to the computer when students are in the classroom . . . I haven't used the computer much with my students because some of them weren't very intrigued and seemed to feel that the software is too childish. I plan to make a greater effort in the future to incorporate computer use into my class site, now that the software selection is greater."

One of the major factors promoting success of the Incentive Grants was the inclusion of inservice into the provisions for funding. One director's comment reflected others: "We needed the funds to give teachers release time and inservice time so they could learn to use the computers. Without that facet of the grant, the computers would have been sitting." One teacher commented, "What a wise decision that was of TLC to grant us [teachers] some inservice time to figure out the best way to use these machines."

Student outcomes were also reported throughout the 18 month grant period. It was hoped that further study of the impact of computers on skill building could be documented through standardized and mastery tests; however, programs used different methods, materials, and tests. Programs, also, did not have base line data that could be used to compare student progress. Because dollar amounts for the grants were limited, it was decided to use and expand existing evaluation systems. Case studies of individual students and observations from staff and teachers provided the evaluator with a wealth of information regarding the impact of computers and other educational technology on students. Two student case studies written by staff members from the

Robbinsdale and South St. Paul Incentive Grant projects follow:

Janice

Janice, female, 29, high school graduate, married with no children, clerical worker for the U.S. Navy enrolled in the Tuesday-Thursday evening program just before she was to meet with the Commander and her supervisor to discuss her work and her relationship with her supervisor. She desperately wanted to be able to say that she was in school, working to improve her skills. Her spelling and math skills were very poor. She had trouble using her reading skills at work, needed for looking up information from various reference materials. She found it hard to concentrate, was easily distracted from a task involving detail, and was intimidated by the computers at work.

The staff assisted Janice in improving her spelling, writing, and math skills; in learning to cope with distractions; in gaining a respect for her skills; and establishing a direction for further learning. She frequently used the computer to practice writing memos similar to those she wrote at work. She used the math tutorials as well as the drill/practice routines. She learned to see the computer as a tool, a tool that could help her remain focused, shutting out distractions. She left the program when she was transferred out of the area, but she left with a new aura of self confidence and a plan to continue upgrading her skills.

Carol

Carol is a GED student who enrolled two months ago. She started working on reading, math, and language skills at the pre-GED level in textbooks.

SOFTWARE: Electric English (sentence fragments, run-ons)
Electric English (phrases, clauses)
Bank Street Writer--essay

SKILL LEVEL/PROGRESS: Carol is using computer exercises as a second attack at a concept when she fails to catch the skill in the textbook. In each case, that has worked. She has understood the concept better after the computer exercise.

PREVIOUS EXPERIENCE: Carol had no experience with a computer. She was noticeably nervous the first time. When she does work on the computer she stays with it about 45 minutes. She is much less nervous now after her three times with the computer. She indicated she was telling her children that she, too, was using a computer in school. She asked about the price of computers. She is currently dealing with migraine headaches and reading the screen is not easy for her. I anticipate that she will continue to use supplemental software exercises as applicable in language and math.

Comments from staff and teachers further substantiate evidence of impact. The use of computers by students helps with motivation, self esteem, and skill building. Staff and teachers observed:

"One unanticipated outcome of implementing computer assisted instruction is that some of our most unmotivated students are the most enthusiastic on the computer."

"Students have commented that they like working with the computer and sometimes do not realize that they are performing successfully the same difficult tasks that they have not been successful at in previous educational settings."

"The students spend more time here. They love the computers and are willing to spend more time studying."

"A mistake is a very personal thing. I had a student tell me recently that he went over a lesson on the computer three times until he was able to make sure he understood and got all items right. He would not have been willing to do that if a teacher would have been present."

"Just being able to use the computer is such a boost for students. Being able to use the computer gives students confidence, a sense of mastery, a sense of pride."

"We are finding that some of our most reluctant learners become the greatest advocates. I had a learner who did not want to use the computer. He is now picking out his own disks and is an advocate for other learners as well as teaching other learners how to use the computer."

"On the computer, students learn to follow directions. The computer is very specific about how it wants them to respond. This following directions is an important lesson for our students."

"The computers give the students a sense of accomplishment; it makes them feel good. Our oldest student, 79 years old, likes the computer and tells her friends about her computer work."

"We are having our learners learn to type using the MECC software on keyboarding. We are, then, teaching learners computer skills that will directly translate into the business world."

Teachers from three sites report that using the computer is significant in that it gives them a skill others, especially their children, have:

"A lot of students feared the computer initially, but feel very good about themselves once they have mastered it. They have then joined the computer age and can use it like others, even like their children. In one case, a student's wife used computers at work and his children used them in school. He can now use a computer . He talked about how his kids were thrilled about this."

"Students talk about how they can now use a computer like their children. The computer gives them status with their children."

"The computer experiences give many students the only exposure they get to this [computer] culture. It prepares them for going out into the real world. It also enables them to operate in the world of their kids."

The 1986-1987 Incentive Grants have, as part of their clientele, persons for whom English is a second language, the learning disabled, and physically and mentally handicapped adults. Their experiences have expanded knowledge about using technology with a variety of groups:

"For learning disabled, so much reinforcement is needed and the computer enables more of this to happen. It also seems safer for students as they will spend a lot of time practicing on the computer where they would not ask a teacher or tutor to go over a concept again and again and again."

"For our learning disabled students, organization and sequence are difficult skills. . . For example, one student was using Bank Street Writer III which has a thesaurus. He was so excited because it was the first time he was able to use one. The computer only gave him what he needed, unlike a thesaurus book where he would have to search to find the complementary words."

"Software at a low-skill level is being used extensively by entry-level English as a Second Language students. This was not a client group we expected to have made much use of the computer."

"The students at Courage Center. . . now demand that [the computer] is put on their individual goal plans. It has been very successful in this program. The key is the basic skills software which identifies objectives and provides materials. It expands the number of ways to teach and it also provides testing. . . For handicapped people, the computer is very useful because it enables them to put answers in the computer on their own instead of asking others to write something for them."

A unique observation made by teachers at two sites, independently of each other, was that the computer facilitated interaction and companionship among the students and with staff. In Robbinsdale, teachers said, "There are times where there are two or three people at the computer discussing materials on the screen. There is something different about their being able to all view the same passage on the computer." LDA staff reported, "Students seem more comfortable with others, especially with other teachers who are in the computer room. There is also more dialogue between students and they are helping each other more. Now students are talking to each other; before they would never reveal that they were at LDA because they had a learning problem."

Unintended outcomes for the 1986 Incentive Grant programs included:

- **Increased capacity to monitor student progress:** Several projects increased their capacity to monitor student progress and to accomplish administrative tasks. One project stated, "A second outcome which may not be entirely attributable to technology but has been measured (discovered) by the computer data is the good attendance, the persistence of the literacy students in the program. This is not consistent with national data indicating that students with the lowest skills have poorer attendance records and are more likely to drop out than students with greater skill."

- **Computer became a marketing tool:** One project found the computer to be a selling point for program services.

- **Student data bases developed:** Five projects put student intake information on data bases. Four projects reported that this decreased the administrative time required to compile statistics requested by the State Department of Education and United Way.

- **Facility expansion:** One project included a computer lab in its new facility. Another program is redesigning its newly acquired space to utilize the computers better.

- **Fund raising skills developed:** Two projects reported improved fund raising skills because of the Incentive Grant. Both undertook fund raising to generate matching funds. South St. Paul reported that the activities also led to "increased awareness of the Adult Basic/Continuing Education Program for local businesses."

- **Acquisition of additional funds for computer assisted instruction:** Four projects were able to demonstrate to administration that the computer made a significant impact on the quality of educational services to their students. This resulted in additional hardware and software, thereby further expanding the access literacy students will have to computers.

- **Improved relationships with school districts:** One project believes the grant "validated" what they were doing in ABE. The director reported, "It legitimized that we were an important part of the school district. When we first went for the grant, we had a hard time getting the district to come up with the matching funds. Now they are willing to purchase additional hardware and add staff (computer aide) for the program. The K-12 programs are also using our computers so we are sharing resources."

- **Computer assisted instruction included in subsequent program budgets:** Additional funds were included in subsequent yearly budgets for hardware and software. One project hired a computer aide to work with learners at the computers, preview new programs, and further integrate technology into the program.

- **New learnings regarding usefulness of software:** The information gained by one project regarding the uses and limitations of the ECHO and speech synthesizer will be useful to educators developing, or choosing not to develop, additional uses.

- **Expanded networking:** Literacy projects funded through the Incentive Grants have begun to network in new ways. One staff member from the South St. Paul project has been called upon to help a number of other projects set up data bases on student records. Robbinsdale hosted an open house so literacy providers could observe the technologies being used. Presentations were given by project staffs at statewide and national adult education conferences.

- **One project became software demonstration site:** Enthusiasm, generated by the activities surrounding the Incentive Grant, encouraged the Robbinsdale staff to seek demonstration site status for the program from two software companies, Educational Activities, Inc. of Freeport, New York, and Educational Skills Corp. of Plano, Texas. The companies have loaned software upon request for an unlimited time without charge; estimated value $6,000.

- **Curriculum materials more accessible:** One program used the data base to catalogue all the instructional materials. An instructor can now identify the materials available in the program to teach a specific skill. It is anticipated that this will facilitate access by new staff and enable all staff to provide better services to students.

1987 Incentive Grants:

In 1987, these eight projects were funded:

- **Chicanos Latinos Unidos en Servicio (CLUES)** received $5,000 to provide additional instruction and increase the quality of instruction in the organization's basic skills English/Prevocational English program.
- **The Dakota County Library, Eagan Branch Library,** was awarded $2,106 to help establish a literacy project utilizing technology.
- **Forest Lake Public Schools, Community Services Department,** received $4,617 to purchase computer hardware and software to introduce technology to a new adult basic education site in a Forest Lake shopping center.
- **Minnesota Correctional Facility; Oak Park Heights** was awarded $4,987 to provide additional software for inmates in existing ABE/GED programs and to introduce educational programming to the segregation and mental health units which had no access to educational services.
- **Northeast Metro Technical Institute** was awarded $1,000 to purchase computer software for existing Apple computers to augment the GED program.
- **Saint Paul Public Schools Adult Basic Education Program** received $5,000 to expand the use of technology at the Farnsworth, Minnesota, site and to introduce technology at its Adams site.
- **St. Louis Park Public Schools, Central Community Education Center** is using $5,000 to stimulate computer assisted instruction in the existing Adult Basic Education program at the Central Community Education Center in St. Louis Park.
- **Survival Skills Institute** was awarded $5,000 to integrate technology into the basic education program for nontraditional mental health services.

These projects are now fully operational. Hardware has been installed in programs where that was a goal and software preview is an ongoing activity. The projects' first interim reports received in June 1988 reflected frustrations similar to those identified by the 1986 Incentive Grant recipients during early stages of implementation. Project directors are finding that their progress has been slowed because: 1) there were delays in obtaining hardware or because equipment was faulty and required repair, 2) instructors and volunteers are reluctant to learn about the computers, 3) the program operates for a limited number of hours which limits the use of the computers, 4) it is difficult to find time to review software available at other sites, 5) there is no one good review of all software materials available, 6) project staff have limited time allowed in their assignments to complete project tasks, 7) most instructors are part-time which limits the time they have available to preview software and participate in training, and 8) some hardware vendors provided poor technical support.

Chicanos Latinos Unidos en Servicio (CLUES) staff members were frustrated by the time it took for their hardware/software order to be processed, then the hardware received was defective and required replacement. Nevertheless, they have been aggressively reviewing software, conducted a

computer and programs orientation to all P.V.E. and GED students, and orientations to the Board of Directors and United Way.

The Dakota County Library, Eagan Branch Library's computers have been installed, students have been recruited, and tutors have received training on Laubach and computer software. The project director has reported that one "great" obstacle is the lack of large blocks of time to work on program activities. She also feels the program needs to explore student placement because the students recruited thus far are not in need of Laubach materials but are operating at a higher level.

Forest Lake Public Schools, Community Services Department: The Forest Lake Learning Center has made dramatic progress. Replicating some of TLC's components, they placed the learning center in a shopping mall in Forest Lake. The are fully operative, but the funds available have been limited, thereby limiting the hours of operation. This has put restrictions on what could be accomplished and the availability of the center to potential clients. The absence of mass transit also has limited access to the center. The center has networked with other programs in the mall and can provide free child care services to clients.

Minnesota Correctional Facility; Oak Park Heights, after consultations with TLC staff, revised hardware plans, resulting in delays but effecting savings. The project decided to purchase computer terminals instead of networking the terminals together throughout the institution. Savings will be used for software purchases and staff training.

Northeast Metro Technical Institute has previewed software. They have visited a number of 1986 Incentive Grant sites and the Technology for Literacy Center. They are actively involving students in the previewing process.

Saint Paul Public Schools Adult Basic Education Program's networking system was operative by April. There has already been so much student demand that time limits had to be set for each student.

St. Louis Park Public Schools, Central Community Education Center staff have been involved in training and software preview. This program is also exploring ways to provide learners with access to the computers before and after classes.

Survival Skills Institute: Many learners have become proficient users of the technology. Two learners passed their GED tests and relied on the computer extensively in their preparation. Some staff members have also become proficient computer users and advocates of computer assisted instruction. The computer has been used in grant and program management, saving time and freeing staff to work more extensively with students.

Strengths, Weaknesses and Issues:

One of the strengths of the Incentive Grant program is its flexibility. Frequently, projects lack the technical expertise to assess their technology needs accurately. Through consultation with TLC staff, these projects have been able to identify the range of hardware and software options available to them and make better decisions. Another strength is the training provided through TLC and the allocation of funds for teacher training and release time. The technology has been more fully integrated because teachers have developed positive attitudes toward the use of technology and the needed technical skills. The extension of the grant time line to 18 months has also been a factor in promoting success. This allowed projects needed time to research hardware and software needs, to obtain equipment, to train staff, and to integrate the technology into their literacy curriculum.

A few weaknesses can be identified. One is that the degree of technical assistance needed in some programs placed a great burden on the TLC staff. It was hoped that the five group training sessions would meet the training needs; however, they were not sufficient. Projects often wanted to spend time, individually, previewing software. The resolution was to have one TLC staff member responsible for setting up specific times for previewing. This alleviated some of the problems.

One of the funding criteria stated that only existing literacy projects could apply. In one case this was not followed. As a result, this project has needed extensive consultation from TLC staff. It remains to be seen if this program will be successful.

It was intended that the Incentive Grants would expand the research component of the Technology for Literacy Center to add information regarding the impact of the computer in increasing the literacy skills of functionally illiterate adults. Upon visiting the projects, however, it was learned that there was no standardization in current data collection practices. For example, no two projects were using the same standardized tests and frequently standardized tests were used only for intake, not posttesting. Because the grant sizes were small, it was decided that it would be inappropriate to request that testing information be collected beyond what currently existed. Consequently, there was no way to correlate the hours per grade level changes or the changes in achievement.

The Incentive Grant Project was also to replicate the technology assisted curriculum and implement educational processes/procedures developed by the center in local existing literacy programs. The Advisory Committee, at an early date, decided that replication did not mean developing a mirror image of TLC. Four programs are using and adapting the TLC curriculum in their programs and all are following TLC's guidelines on selection and integration of software. It is noteworthy that the ABLE center in North Caroline tried to replicate the ABLE center at other sites and was discouraged by the results. It may be that the Incentive Grant model, where projects adapt curricula and learnings from a center like TLC, has more likelihood of success.

Certain key aspects of the incentive grant approach are critical to the successful adoption of technology: 1) programs must be able to get access to hardware if access does not presently exist, 2) programs need additional funds for program software, 3) stipends for staff training and release time are critical, 4) technical assistance on an ongoing basis must be provided, and 5) worthy literacy programs should be funded and allowed to adapt technology in their own unique ways.

TRAINING

Three primary training purposes were identified in the original proposal: 1) to increase literacy skills of adults by introducing the use of technology assisted instruction in existing literacy programs, 2) to inform basic skill instructors regarding the use of technology and its integration into the educational delivery system, and 3) to facilitate cooperative efforts in technology assisted instruction among literacy providers by providing training related to research findings, curriculum design, and organizational requirements. Training was to be provided through individual internships, workshops, conference presentations, and dissemination of written documents. In the summative evaluation, the conclusion reached was: "On balance, the training component appears to have contributed substantially to the TLC effort, both in its contributions to others and in making TLC staff more reflective and effective." Information on the full three years of operation is summarized here. The data was collected from TLC documents; staff calendars; and telephone and face-to-face interviews with literacy providers, Literacy Training Network trainers, literacy specialists, TLC staff, and TLC interns.

Internships:

The TLC goal was to have 60 interns over the three years. TLC has had nine internships. Dr. Patton, in the summative evaluation, reported that TLC did not meet its internship goals but that these goals may have been "unrealistic and unmanageable." This is a reasonable assessment. TLC staff, in an effort to make the the internship meaningful, expanded it beyond the intended six week commitment. Some internships have continued up to six months. TLC found that considerable time was required to monitor interns' activities and found that even more interaction would have been valuable to interns.

Three of the interns found the TLC experience led to employment; two now work for TLC and the third obtained employment assisted by references from TLC staff. One intern used knowledge gained in the TLC experience to integrate technology into the literacy program for which she works. Another relied on TLC heavily to help her start a new technology literacy program. One intern has remained active as a volunteer tutor for TLC students. In written evaluations and telephone interviews, TLC staff were rated as very helpful and generally readily available. One intern reported, "I was amazed at the time she [the TLC field supervisor] spent with me explaining various aspects of TLC. She never seemed bothered by teaching/helping me." Another said, "TLC is an excellent place to work. It seems to me to be the ultimate way to do programming." She went on to say that the internship exposed her to a wide variety of software, possibly available elsewhere only at a conference meeting with vendors.

Areas that might be examined for future internships, as suggested by the TLC interns, included: 1) allowing more flexibility in completing certain requirements of the internship as some experiences duplicated skills the intern already possessed, 2) giving the intern more background, especially on TLC policies and procedures, before having him/her work with students, and 3) giving closer guidance during the internship.

Workshops/Conferences:

Since 1985, TLC staff members have conducted over 80 workshops or presentations to conference participants. These sessions have focused on topics such as curriculum development, previewing educational software, comparisons of hardware, evaluation, and volunteer program development. It has been estimated that the TLC staff has had contact with over 2700 literacy providers, ABE teachers, literacy professionals, and individuals interested

in the literacy issue. During the past year, Dr. Terilyn Turner has presented at numerous conferences and has been the keynote presenter at The Massachusetts State Adult Basic Education (ABE) Conference, the American Library Association Conference, and the Annual Adult Literacy and Technology Conference.

TLC has hosted two national conferences: 1) "Conference on Adult Literacy and Computers," November 20-22, 1985, and 2) a training for "technology consultants" for the Adult Literacy and Technology Project funded by the Gannett Foundation.

This past year, TLC, through a grant from the Gannett Foundation, developed and conducted training for 121 ABE providers from throughout the state of Minnesota. The workshops were designed to provide information on hardware, software, and the use of technology in literacy instruction; to help literacy providers use computers and other technology with adult learners; and, to give suggestions on how to access technology if the program did not have computers. The evaluations completed at the end of the workshop were uniformly positive.

To help understand the impact TLC has had on those participating in workshops, a random sample of participants (15) and the regional coordinators (4) from the state-wide training were interviewed by phone. Almost all of the interviewees remained postive about the training they received from TLC. They thought the strengths of the training were directly attributable to the fact that TLC staff tried to identify specific needs for each region and incorporated materials into the workshops to address those needs. Participants and facilitators reported having benefited from the training, a noteworthy accomplishment considering their range of experiences with computers:

> "The workshop helped as I could find materials in one place, learn who to contact, and how to use the computer with Laubach. It was the first workshop I have been to that didn't cover the same stuff over again. I have been in literacy eight years."
>
> "I learned new things. I have been working with computers five years."
>
> "I'm a newcomer to the literacy field, since September 1988. The workshop more than surpassed my expectations. I liked the variety, the hands-on at the Center and at the PALS lab. I was excited by the interactive video."
>
> "I appreciated the handouts which gave me background before the workshop. I need advice for a novice, how to encourage me and students to use computers. I appreciated the availability of staff to answer questions and to dialogue. I liked the technical information and the honest response to questions."
>
> "For me personally it is not that the training taught me a lot new but it broadened the scope. They talked about materials I may have been familiar with, but they taught me how to use those materials in new and unique ways."
>
> "I had been to computer workshops before. I especially liked the hands-on. This gave me the chance to preview new materials I hadn't seen."

> "I don't have computers in the program now, but I liked the chance for hands-on. I liked previewing possible materials I could order if we should ever get one. What stands out is, I am computer-scared and I felt better after I tried computers at the workshop. . ."

Another strength identified was the application of the information to the programs of the participants. Comments included:

> "TLC and its curriculum is applicable to other programs because the backbone of the TLC program is the hardware and software to which every school district has access."

> "The strength of the training is that it helped programs become aware of the things that are available [the technology that is available] and how to incorporate that into literacy programs."

One participant said that TLC's work "modernized" the Minnesota Literacy Council training "by using technology in a variety of ways," and continued, "It was valuable to see [TLC] even though not all was applicable to my situation."

The curriculum development and the annotated bibliography of software developed by TLC was rated as very valuable to all literacy programs. One participant reported, "It is valuable that TLC has a curriculum developer. It is such a time saver for other literacy programs. Programs don't have the time or resources to review every piece of software." Many interviewees reported hearing that TLC might copyright the curriculum and make it available to other programs, offering encouragement to TLC to do so.

Workshop participants felt comfortable calling upon TLC to answer technology/software questions. One's comments reflected others. "I personally have called up a number of times to ask [the curriculum developer] about certain pieces of software. Often she has reviewed it or is aware of it or is using it and can give me feedback regarding its value." Participants thought TLC was particularly helpful in helping programs identify ways to gain access to technology and acquire hardware and software at a minimal cost. TLC also helped many programs discover new resources:

> "TLC helped programs learn that there are computers in their areas. . . such as in school buildings that are not being used at night and all they have to do is ask."

> "The strength of the training is that it helped programs become aware of the things that are available . . . Many programs had technology resources available but had not been using them."

Only a few comments were made regarding weaknesses of the state-wide training. Some participants wanted more hands on time with the software. A few commented that it would have been better if the content presentations were spread out over more days. Some respondents thought the groups were too large and recommended future workshops break the content area into ABE and GED groupings. TLC may also wish to evaluate the accommodations if future workshops are held. These suggestions and areas of weakness were made generally only after interviewees had been prodded and within the context of very positive responses. There were, however, two interviewees who found the workshop unacceptable. Their reactions will be presented here even though other evidence is strongly to the contrary:

One participant said, "It was too quick. I got some shallow information but it didn't help. I got no competence of my own from the workshop. The software exposure was too superficial. The opening presentation wasn't helpful. It was remote. It just didn't seem applicable to me. The rest was practical but the content was too dense. . . I wish I had more competence. It was very anxiety provoking. I saw the value but couldn't use any of it. I felt that a little knowledge is a dangerous thing. . . The training left me overwhelmed. . . It isn't that I felt the workshop to be trivial or not worthwhile; it opened so many avenues of awareness that I felt overwhelmed."

Another interviewee reported, "I participated in the [region] workshop. The training went well and it was well organized and a lot of people thought it was good, but I would look at those evaluations with a grain of salt. The people who participated in the workshop were a 0-3 (on a scale of 0-10) in terms of their computer experience. I think they got a lot of positive responses from the participants because they were very hungry and did not know a lot so were impressed with whatever they got.

"For the training to really have been effective, I think it needed to address more directly the issue of access; how to obtain access to computers and software. In addition, it needed to focus directly on communication with school districts. If the goal was to integrate technology into literacy programs, they were not successful. The reason is because the target participants for the workshops did not have access to technology and the program did not really focus on integration.

"I'm not sure if in three years TLC has done much regarding integrating technology into literacy programs. I have seen the director's dog and pony show. It is too broad based. I have gone to a lot of meetings and seen the same teachers. The training should: 1) help programs write curriculum and specifics on specific software for specific parts of programs, 2) have a TLC person do a newsletter or article on how to use specific software to teach in the classroom, and 3) specific help should be provided on a statewide basis where the trainer goes out to programs."

Participants stated that the workshop gave them confidence to use what was available and confidence in knowing what materials to use or preview. Comments which reflected others were:

"We took the workshop as we knew we were going to get a computer. The workshop was great for its technical advice, i. e. how to turn it on, what programs are available for previewing. It was reassuring to us to see how the computer can be used."

"Coming back and using the computer with confidence [was an impact of the TLC training]. . . Knowing what materials to preview. There is no money in the budget for anything but MECC software, but we now have an idea of what to order in another year when we have more money."

Training helped programs become aware of resources available that were not being utilized:

"It gave us better ideas about how to present materials. I didn't know about the variety of MECC materials. I didn't know the High School was using materials, and

> I now use their materials a lot. We have five Apples which didn't get used, plus a laser disk printer. Since the workshop, instructors and students are using computers."
>
> "It gave us the knowledge of where to go to get software. From them [TLC], I learned to go to the Board of Education to borrow materials."

Three participants reported writing or hearing of someone who was writing grant proposals to acquire hardware and software. Participants used the written materials from TLC to educate others about the value of technology or to help their organizations make technology decisons:

> "I have used some of the papers the Center Manager gave us regarding computer assisted learning, the relevancy of methods for teaching adults, and how immediately transferrable computer skills are to enlighten community college educators, jail personnel, and the state hospital. The materials are especially good in explaining the importance of computer assisted learning in conjunction with one on one learning, such as fostering independent learning via the computer."
>
> "I am on the School Board where we have been looking at the Plato system for the school. The training, information, and help at TLC allowed me to make recommendations to other board members--recommendations about money, how many stations, etc. I helped the district that way."

It appears that the training was also helpful in generating enthusiasm for computers and legitimizing computers as effective tools to be used with adult literacy students:

> "One consortium member remarked on the way home from the training that she had all this technology available to her but did not realize how it could be used or that it could be used in her program."
>
> "The workshop also validated, motivated me . . . I saw how adult learners would want to use software, how it would provide him/her with independence, to become less reliant on the teacher."
>
> "TLC has had an impact on literacy programs in Minnesota. It is giving credibility to the use of computers. For many teachers, computers were a threat. They were concerned computers would replace teachers."
>
> "By sharing knowledge, the TLC training enlightened outstate Minnesota and encouraged networking."
>
> "TLC has had an impact on literacy people and how positive they feel about computers. TLC has really tried to reach out throughout the whole state, and to the best of their ability, has responded to people who asked for assistance. This was even though they had more people asking for training than they had expected."
>
> "Before there was only one ESL instructor who didn't want to use computers. She tried software, got hooked, and so now she's using computers with students. This, as a result of the training."

"It got us using computers more than before. Seeing the enthusiasm from Teri and her staff helped a lot, too."

Frequently, the TLC training was seen to facilitate networking among literacy providers and others:

"The TLC project impacted St. Paul. The fact that so many people came for the workshop to see the program working is really something. All who attended took something away and may want to implement a piece of what they learned. Also, the networking was very positive. That [networking] was the biggest plus statewide."

"I have also previewed in Rochester, at an ABE program there, and at IBM in Rochester. All this because of TLC!"

"TLC training did have an impact. They helped me make a contact with PALS in Rochester. In fact, this fall I'm going to host a training with IBM. We plan to have 60 people involved. I did not know I had access to those people in Rochester. The TLC training put the idea in my head."

"TLC helped us get together--those with a common goal and problems. It helped us become aware of what is available and the way to handle it."

"Teri spoke about how you have to advertise your program, how we need to get the business community involved as has happened in the Twin Cities. We have just had a big business breakfast and as a result we got business types involved. We raised awareness. The newspaper in Duluth offered us a new worksite at the newspaper. We're writing a grant for this. The hospital thinks it will have things we can use like typewriters, and businesses are talking about giving scholarships for literacy."

It would not be fair to attribute the happenings in Duluth solely to TLC as the Minnesota Adult Literacy Campaign (MALC) was responsible for organizing the breakfast. However, it appears that the MALC message was reinforced through the TLC workshop.

Other impacts attributed to TLC and the TLC training were:

"TLC has also had an impact on the literacy community through staffs' meeting with others outside the literacy field. TLC was a big help in communicating that literacy is a problem and why it is a problem. TLC has been a real leader."

"Being so far outstate, I cannot speak for the impact of St. Paul/Minneapolis. But by getting us into the Center, they promoted technology in literacy. We saw what CAN be done on that or on a lesser scale. TLC is a real model for us."

"It was really good to see a model of how it is all together in one place. We saw that it does work . . . "

"TLC has put the Twin Cities in the forefront as far as literacy goes. I was very impressed. And how to work with big companies; I learned about that."

"Teri and TLC are committed to literacy, to adult education. Teri . . . makes a real push for literacy awareness. It is too bad we cannot have a TLC outstate."

"I was impressed by TLC and Teri. They bring professionalism to the adult basic education field. . . I think they impacted us because we can say with confidence that our one computer is a necessary part of our ABE program. We feel we could call

TLC if we had a problem. There is good networking, and a professional feeling about TLC staff and outsiders."

"It provided a professional side of ABE I haven't seen before. TLC has an excellent reputation. Even my students in [city] refer to TLC. It is well known outside and inside the metro area."

There are concerns that TLC may not be involved in training in the future:

"They have the resources and the curriculum. It would be good for them to share that curriculum so that other programs are not reinventing the wheel."

"I would like to see them stay in training although I know there has been talk about the way it detracts from direct service."

"I, in fact, would like to see the training expanded. I know the main mission is direct service, but their training activities are also important for the field of literacy. I know that the training has been a burden on staff. Maybe in the future TLC should look at having one or two people as full time trainers to minimize this burden. I would also like to see the facility expanded so that it is not necessary to close down the center to students while training is being conducted."

Other Indicators of Impact:

Many TLC instructors work at TLC part time. In a group interview, they talked about their unique opportunity to learn how to use computers in educational programming and their pride that many people in the literacy field see them as "experts." Because TLC is within the Saint Paul Public Schools, instructors had to be or become ABE certified; there are now four more instructors with this certification.

Dissemination:

TLC materials have been distributed widely. At least 1653 copies of the summative evaluation report, Adult Literacy and Computer Conference Proceedings, and the annotated bibliography of software have been distributed to 51 states and 9 foreign countries.

Summary:

TLC has informed basic skills instructors regarding technology and its integration into the educational delivery system and has facilitated cooperative efforts in technology assisted instruction among literacy providers. Participants found the training valuable and would like to see TLC continue to help other literacy providers.

RESEARCH

The research component of the original proposal included activities for study of the value and applicability of technology in basic literacy instruction and dissemination of the results. At the end of the second year of funding, the summative evaluator concluded that, "The research component is the weakest and the least implemented in comparison to the original proposal. Many of the preliminary discussions with organizations such as the Northwest Regional Labs and the University of Minnesota had not resulted in specific research projects."

At the end of the final year of funding, however, there have been significant outcomes. A Master's thesis is in its final stages. This study examined: 1) What variables correlated highly with attrition at TLC? 2) What variables correlated highly with persistence at TLC? 3) Which variables are controllable, that is, which ones can TLC make accommodations for in the interests of reducing attrition? and, 5) Which variables are uncontrollable, that is, which ones can not be modified or corrected by the characteristics of TLC? This study used the student demographic data collected by TLC in Years I and II.

A list of the articles and presentations regarding data collected at TLC follow:

Turner, C. Terilyn. (1988, April). Using the computer for adult literacy instruction, Journal of Reading, 643 - 647.

Turner, C. Terilyn. (1988, June). An overview of technology in adult literacy programs, Life Long Learning.

Stockdill, S. J.; Lewis, D. R.; & Turner, T. C. (in press). Benchmark costs, efficiency and the use of computers in adult literacy programs. Proceedings of the 3rd International Conference on Education & Growth. Buenos Aires, Argentina.

Lewis, D. R.; Stockdill, S. J.; & Turner, T. C. (1988, April). Micro-computers in adult education: Results on the cost-effectiveness of TLC and PALS. Paper presented at the Meeting of the American Educational Research Association, New Orleans, LA.

Lewis, D. R. (in press). Cost effectiveness considerations in the use of computer assisted instruction for adult basic education. Computers in Human Behavior.

Turner, T. C. & Stockdill, S. J. (Eds.) (1987). The Technology for Literacy Project Evaluation. (Report prepared for the TLC Project Donor Review Board). St. Paul: The Saint Paul Foundation.

There have been 330 copies of the Technology for Literacy Project Evaluation distributed across the country. No more copies will be produced, but it will be available to anyone who wishes through ERIC, the Educational Research Information Clearinghouse.

Dr. Turner and Dr. Stockdill have been asked by the Adult Literacy & Technology project, coordinated by the Institute for the Study of Adult Literacy, to write handbooks on designing adult literacy and technology centers and evaluating literacy programs. These documents will be made available to literacy projects nationwide.

Given the charge of the research component, the Technology for Literacy Project has successfully accomplished intended goals.

THE TECHNOLOGY FOR LITERACY PROJECT:
Conclusions

TLC staff, funders, and nationally recognized literacy specialists were interviewed to identify the characteristics of TLC that promoted or limited its success and the unintended outcomes that have occurred.

Interviewees identified factors which promoted the success of TLC. These included:

> "The strength of the program was clearly the commitment and the sensitivity of the staff and volunteers at TLC. The fact that they did not have negative expectations of the target population made all the difference in the world. There was no educational triage being practiced as part of the program. They believed the people could do it. They conveyed that belief, that confidence, and they were committed, and, I think, accountable indirectly to the funders but directly to the people who participated in the program."

> "The program and the materials that were available, the books that it encouraged people to take, were not sterile, academic, ivory tower, safe middle-of-the-road textbooks. There were novels, there were childrens' stories, there were Ebony and Jet magazines, there were things about this week in the soaps that reached the people the program was designed to service at the level where they were at, not at a level where it hoped they would go or where they ought to be."

> "My sense is that the program worked with people rather than programs that parachute into communities to "fix"... that do things for people but not with them. When those programs leave, the skills they imparted leave with them."

> "The hours that it is open gives the adult population a different perception of a literacy program. It is not a traditional, "Come back to school between the hours of 8 to 3," but it is open adult hours and on Saturday mornings. It's not only given literacy and adult basic education a new look because of that, but it's also been able to meet learners' needs better because of those hours."

> "It turned contemporary research in combination with contemporary technology into a solution for what is, by all peoples' determination, an important and critical social issue."

> "[TLC] immediately involved the advisory council. We went though a process of citizen involvement which was very important. I think that the whole advisory council... felt they had been a part of the decision to try this."

> "The training could not have happened nor could the incentive grants program have happened if the direct service hadn't been provided. I would look at the direct service component in two ways. One, it did impact people, and secondly, it was a very important and strategic part of the overall effect/impact of the rest of the project to the other components of the project."

> "The components of the incentive grants and the state wide training have really provided two avenues to use what's been learned in TLC and get it out into the community, that broader literacy community... Even though programs would

> have wanted to integrate the learnings of TLC and the use of technology, most of them had not, still do not have, a budget for those kinds of hardware equipment expenses."

> "Because TLC is a direct service provider, the kind of speaking and training Teri does is very grounded in the practitioners kind of point of view and interest. She can talk on a nitty gritty level and not just a theoretical level about the concepts of the use of technology as well as evaluation."

The location was identified numerous times as a critical success factor. One funder noted:

> "For far too long, programs have been inaccessible to the very people who were most in need of help. . .TLC wasn't just another one of the 1300 nonprofits in the Twin Cities, but it was one that was ideally matched and targeted to the very people who could benefit from it. It was on bus lines, had easy access to the freeway, it was where people would go to shop and eat and so on. . ."

Two donor review board members thought that the coalition building, planning, administration, and monitoring functions undertaken by The Saint Paul Foundation exemplified the valuable roles community foundations can play:

> "Pulling everybody together around an issue, [generating] the funds, and then monitoring the results---that is really a good role for The Saint Paul Foundation."

> "I think that the community foundation is a wonderful vehicle for small corporate funders who don't have any staff and who can't do the homework for the grant or the followup in the evaluation. For me, that's just an ideal thing to have a community foundation do . . . I think that there are probably many other corporate funders who might find that effective."

Board members generally found the association with the Saint Paul Public Schools a critical success factor for the TLC project. One board member's comment, which reflected others was, "The cooperation of the school district was perfect. I doubt we could have done what we did without their support. We owe them a great deal for that." One donor believed, however, that there would be unique challenges to TLC to "maintain its integrity and credibility as part of the [Saint Paul Public Schools] bureaucracy. . ."

Interviewees were complementary to the evaluation itself which reinforced and gave credence to putting resources toward evaluation. A number of funders changed requirements for grants to include some form of evaluation. This was not only to provide funders with information regarding project activities, but was primarily because the funders saw that evaluation can help a program build on its strengths and address its weaknesses. One comment reflected others:

> "The evaluation . . . had an enormous purposeful impact on the program and the program's direction so that the changes that came about in the program are not a consequence of just sort of impressionistic feelings . . It seems to me that the changes that the program has undergone have been very thoughtfully arrived at and have been the product of some very rigorous definition and redirection."

Board members were concerned about TLC's future, asking if sufficient funding had been raised to continue the project. Many expressed a desire to see the Saint Paul Schools commit to maintaining TLC. One donor believed the schools would do considerable harm to their relationships with funders if TLC does not continue.

Weaknesses were more difficult for the respondents to identify. Three donors wondered if the Incentive Grant program and the training had had any impact on literacy programs. One donor had hoped that more research would have been conducted by external organizations. Another board member would have liked the TLC program to do more "capacity" development by recruiting former graduates of the program to work as volunteers "so that people who were formerly illiterate could work with people who are presently illiterate and then create that ripple [in the community]." Two donors reported concerns in the area of attrition, although they were not sure what TLC could do differently to affect this issue. One donor's comment was:

> "I think the main weakness comes from your attrition. I think that's a very difficult thing to track primarily because of the clientele with whom we are dealing. You are dealing with people who can't read or are having trouble with math. The whole subject of literacy in a sense sounds like an alcoholic. . . you've got to want to help yourself. There are several deterrents or things that come up and prevent carrying through a person's initial resolve to do something about their literacy. I'm not sure what you can ever do about that because you are dealing with people. I don't know where you go from there.

Another concern was that the cost involved in setting up and operating a center like TLC may make it difficult to replicate on a wide scale basis. These donors hoped that lessons might be learned from the Incentive Grants regarding how technology can be integrated into existing programs so as to improve their quality and efficiency in operation.

TLC staff were more likely to identify areas that TLC needed to address. Staff are concerned that greater numbers of learning and emotionally disabled persons are enrolling in the program. The staff does not feel they are adequately prepared or possess the professional skills needed to meet these learners' special needs. Staff also wanted to continue to explore ways to help learners continue their progress toward educational goals even though it may take years of constant association with the program. One specific weakness of the open lab setting, as seen by TLC staff, is that there is more limited continuous contact with learners than in a classroom setting. Because learners can come to the program at times most convenient to them, instructors may not work with the same learner for any length of time. The curriculum developer believes this is especially limiting when teaching writing skills.

Throughout the three years, TLC staff struggled to find time to address the training, incentive grants, and research goals while continuing to provide quality service to learners. These three components were recognized as receiving less attention than the direct service component. A possible solution might have been to hire additional staff with specific assignments to implement training, research, or incentive grant activities.

Literacy specialists and providers are concerned that they continue to have access to the center so that they may stay informed on how to maintain the effectiveness of literacy programs. Funders are concerned that if this approach to the literacy issue is valid, as previous evaluation findings have indicated, similar centers should be started or the factors which promote success be communicated and integrated in other literacy programs. Concern surfaced that the Saint Paul Public Schools may be too inner-directed and not committed to sharing TLC with others.

These interviewees wanted to find ways to train, disseminate the TLC findings, or replicate the TLC model. Others, in particular the TLC staff, were concerned that the training mission in the past interferred with direct service to students and greatly increased the stress on staff and instructors. There was concern that so many programs may want assistance that TLC could not maintain a quality level response to the needs of both students and literacy providers. And one funder said, "The St. Paul taxpayer can legitimately say, 'Why should we pay to teach other people how to do that [operate an effective literacy program].' " Recommendations of two funders were:

> "This is an area which ought to be of interest to the adult literacy campaign. If there were to be a private entity which has been described as a literacy foundation of some sort, this is exactly the kind of thing that entity ought to focus on."
>
> "I think one of the things we don't want to fail on is really promoting this . . . I think you have to market it. Writing a report doesn't do anything. You may have to have an invitational seminar or be invited to other seminars. Maybe some money has to be set aside to get out and market this idea. Maybe some national convention and some national promotion and fund raising ought to come out of this. Maybe it has to be a special staff set aside [to do this]."

As the Donor Review Board meets this final time, discussion on this issue may be warranted.

Outcomes identified from the TLC project included:

- Some funders are more willing to invest in literacy efforts.
- Evaluation requirements are being built into granting procedures.
- There is increased networking among funders and providers.
- Literacy providers have an expanded vision of what a literacy program can be.
- Minnesota has attained a role of national prominance in literacy and technology efforts.
- The value of promotion and advertising has been demonstrated to literacy programs.
- The image of adult basic education has been improved in the St. Paul Public School District.
- New training networks and models have been established.
- Literacy projects gained experience in approaching foundations for funding.
- Some of the fear associated with using computers in literacy programs has been alleviated.
- Many suggested the TLC project increased understanding of the literacy issue as well as its relationship to teenage pregnancy, cycles of poverty and unemployment.
- Recognized as having expertise, TLC is being asked by software and educational materials development corporations to review and evaluate materials.
- The curriculum developer was also hired by Control Data to revise part of their basic skills curriculum.

The Technology for Literacy Project has had a major impact on many organizations, the field of literacy, and functionally illiterate adults.

APPENDIX A

CASE STUDIES

To further portray the impact TLC has had, five case studies were developed. Although not as extensive as the summative evaluation case studies, these represent the wide range of learners attracted to TLC. The information was collected through a face-to-face interview with each learner and a review of TLC records. Names have been changed to provide anonymity to the participants.

Lorie Jones

Lorie Jones is a 33 year old single women, required to attend TLC because of the newly passed welfare legislation stipulating that GA recipients attend school. Lorie has been in the program for three months and "really likes the computers--the computers make it more interesting."

When asked what she expected when sent to TLC, she responded, "At first I did not think I was going to like TLC. That was before I learned that they had computers. I expected it to be more like a teacher thing. The problem for me is if someone tells me how to do something, I forget. But if you show me, I can do it."

Lorie graduated from high school in Oklahoma. She tried going to college but had to quit because the "work was too hard." Lorie's test scores indicated that her reading comprehension was between 4th and 6th grades.

Lorie talked about her experiences with school and stated that, "TLC is different. In a regular school, teachers can't give you the time you need. When I did not get something in class, I did not say anything to the teacher. I never got up in front of the class--so I was a bit slow in school. . . Now with the computers, the PLATO, when I don't understand, it [the computer] has a place where I can push a button and it will review the lesson. I don't have to tell anyone I don't understand. All I have to do is push a button and I get it."

Lorie does not like certain things about the CCC computer. "The time on CCC--it gets to you. There are a lot of trick questions and you are sitting there and trying to figure it out and 'Boom' the question is gone and it's on to another question. On Plato you can take time and think. You see, I have to read the question at least two times to get what it means. . . On Plato, I can take notes. I have lots of notes in my folder. But on CCC you can't take notes [because it moves on too quickly]."

According to Lorie, "The teachers help a whole lot. [Instructor] can tell when I'm bored. He says, 'Lorie are you bored? How would you like to work on this?' I then switch to other materials. I know I'll like it [the other materials] because I have liked what he has found before."

Lorie's goals at TLC are to improve her skills so that she can get a good job in computers. During the time at TLC, the CCC computer testing system shows that she has improved her reading skills 2.72 grade levels in 31 hours. She has also noticed changes. "I did not used to like to read and now I like to read. I have accomplished a lot. I'm more willing to try to learn."

It appears that Lorie has become more open. She wanted to talk to me about her TLC experience. I was surprised she said she did not like to ask teachers questions in high school and was very shy. When I asked her if talking to someone like me wasn't a change for her, she said, "Yes. Also, the first time I was here [TLC] I did not say much to anyone. Now I'll talk to anyone."

Joseph Williams

At the age of 77, Joseph is going back to school because, "I want to learn how to read and write and get a general education. I want everything I can get." Growing up on a farm in Oklahoma, Joseph felt that his father "had funny ideas. All the girls [his sisters] were sent to school but he [his father] kept the boys at home. The boys only got to go to school when it was too cold for the girls and then the teacher would usually tell us all to go home because it was too cold to study."

Joseph is a survivor. He worked for the railroad for a while and spent 29 years as a butcher, a job he retired from in 1976. He said no one ever cheated him. He knew he had to make sure that he could figure his hours for his time card, so he learned his numbers and, "I never cheated anyone, and I never cheated myself."

Joseph learned about TLC through a friend who also attends. He wanted to learn to read "the whole newspaper and the Bible." Because his pretest score was 1.4 he was placed in the basic reading course where he works with a volunteer tutor and the computers. Joseph has been coming every day since April, and he said that he always calls if he has to miss a session, a fact supported by TLC staff.

When asked what he liked about TLC, Joseph said, "It's a good chance to learn. The teachers are nice--they got good teachers." Joseph also liked the computers, although reporting, "They are good if I can understand them--sometimes I punch the wrong button and then I'm all messed up." One of the TLC teachers said this was true and that Joseph would sometimes not ask for help right away and then get very confused.

Joseph says TLC has had an impact. "I know more now. I can do math now that I could not do before. I can write a little better. I can read a little better. I can buy my own groceries now. I used to look at the picture on the can and try to figure out what it was. Now I can read some of the words on the cans."

Joseph said he can now read road signs and asked me if I knew he traveled a lot. He then proceeded to tell how he compensated for his inability to read road signs by having someone look up the miles between places. He would then know by his odometer when he had reached his destination.

Even though Joseph is making progress, the time it is taking is sometimes disheartening. "It is hard to get the sounds. I work with a tutor one time a week. I can understand the sounds but I forget them. Sometimes I go home and wonder what is the use. Why should I keep going? But then I think, 'I started out to do this and I'm going to keep going.' I always finish what I start."

Joseph thinks the program could be improved if he could have a tutor every day, but, "I know that is hard for the program to do." TLC staff have been notified of his wish, and are looking for an additional tutor.

Edward Johnson

Edward came to TLC after a recent divorce from his wife and recent completion of a chemical dependency program for his drinking. He talked about the divorce and how much it had hurt him. They had been married for a number of years and had 4 children, ages 16 to 20. His wife was a college graduate and toward the end of the five year divorce process had begun to use his illiteracy as a weapon. He said, "No one should treat another that way. . . You know there are a lot of people out there who cannot read."

Edward learned about TLC through his sister. He had had numerous experiences with literacy programs. He had worked on the Laubach series at another program but still could not read. He felt the other programs had "rules" that teachers/tutors could only do things in certain ways but that TLC was different in that his tutors and instructors were willing to try a number of different materials and methods to help him truly understand and learn. He said that he had been lucky to have two of the best tutors at TLC; two tutors, however, did not work out and he requested to be matched with others. He said he had to change tutors because one would only use Laubach materials and the other could not understand how Edward could pronounce a word, understand its meaning, and read it but could not write or spell the word. Edward knows that TLC does not require that only Laubach materials can be used, but thinks volunteers say this because they are afraid to try other things. I asked Edward how TLC could monitor this and he said it was up to the student to tell TLC they are having a problem with a tutor.

Edward credited his tutors and the TLC staff with working hard to answer his questions, such as, "Why and when do you change the y to i and add es?" He noted with admiration that a day after he asked a question, there would be an answer in his folder. An entry in Edward's learning log states:

> Edward:
> I tried to locate the answer to your question and had a hard time coming up with a tidy rule. Here's the best I could do: A compound word such as everyone is a noun. If the two parts are separated, "every" is an adjective modifying "one" (the noun).
>
> I was glad everyone (noun) came to the party. He ate up every (adjective) one (noun) of the candies in the bowl. I hope this will help you.

Edward's case is an example of TLC at its best. For example, notes in his folder indicate that the reading specialists, his tutors, the lead instructors, and Edward all are monitoring his progress and making adjustments as needed. One entry stated:

> "Talked with [tutor] and Edward and checked with the reading specialist and lead instructor. Our plan, worked out with [another tutor] looks good: 1) finish Skillbook III, take final test, 2) TABE test. . . to see how Edward's reading looks. . ., 3) depending on results, take a break from Laubach: Master spell program is one choice and/or math inventory to see level math Edward should start on. Questions? [reading specialist] or

[instructor] would be glad to help. [reading specialist] may be easier to reach. Also, she knows of a learn-to-read video she thinks Edward might like. Please see her about."

During his time at TLC, Edward has made statements to his tutors and instructors like, referring to homonyms, "Now I understand why proper English is so important." His tutor also recorded, "Edward continues to be enthusiastic and eager to learn."

Edward has spent 410 hours at TLC. He has been in the program since it first opened. During that time, he has gone from being unable to take the comprehension test on TABE to 1.8 grade level. He also has gone from 1.7 to 2.1 grade level on the vocabulary test. Edward also sees progress. He reported, however, that he is still afraid to read on his own. He knows he can read a book but when he tries it at home alone he gets afraid. Yet, if he takes that same book to one of his tutors, he can read it out loud to them with very little assistance.

Kent Burton

Kent Burton is a 30 year old student who tested at 12.9 on the TABE reading tests, 8.3 on the math tests, 5.8 on spelling, and 8.1 on language. He learned about TLC through an ad in the community education paper. When asked during intake why he came to TLC, he said, "To improve my language skills." He was working full time in electronics and had worked on Plato at work.

This is one of the learners who appears and then disappears from TLC on a regular basis. He said that he choose TLC because it was a walk-in program versus a classroom program. He said at first "I preferred the liberty of being able to come and go when I pleased. At that time I working an off shift and I could only come in in the afternoon or on Saturday." Kent found, however, that it was "hard . . . I could not always get myself to come into TLC. It may have been better if one had a specific goal in mind. Mine was to work on math, writing, and English." He said that the "openness" of TLC "made it easy to put off going to school."

About the writing class, Kent said, "It was from 10 to 12 every Friday. That made it easier for me to make myself come." I asked if there was any way for TLC to help people like him come on a regular basis. He said, "Maybe if you have more classes." I asked what he thought about developing a calender for the month with specific times and dates he would be expected. He said, "I would not like that. I would not like anyone controlling my week." He stopped and looked at me and smiled, "I guess it is a Catch 22."

Kent worked on the Apple and CCC computers. He said, "I liked the CCC at first but after a while I did not like the competitive nature. I really like the Apple better now because it is more relaxed versus the high pressure. On CCC everything is timed. I don't need all the bells and buzzers. I like having the words per minute report that comes up on the computer screen."

Kent was impressed with the versatility of what was available at TLC. He said that one could lose some of the "personality" between the teacher and the students because it is not a classroom structure, although he also said that that bonding still goes on at TLC.

Kent said TLC has helped him. "My reason for coming to TLC was to brush up on my language skills to go into junior college. I am in junior college now. It really helped in my writing class. They expect that you know all those things [grammar]." Kent's TABE scores in language and spelling showed 3.5 and 1.4 grade levels increases in 38.3 hours at TLC. A note from an instructor in his folder also reported, "Kent said that for the first time in his life he felt confident enough to send out Christmas cards so he sent out a dozen."

When asked if he had additional comments, Kent said, "It's an excellent center. It is ahead of its time. Everyone, all the teachers can answer your questions. Like the English teachers can answer a math question, which is good. I have told many of my friends about the center."

Cassie Jones

Cassie is 33 years old. She had been working at an assembly plant and was laid off. She found TLC by "passing through the mall" and decided to come in to "improve" her "math skills." After completion, she hoped to get a better job, perhaps as a medical records clerk. Cassie graduated from Mechanical Arts High School. At the time she enrolled, she had been in another Saint Paul ABE program and left after 12 months because, "I was through." Cassie's scores on TABE were 5.6 for reading and 4.5 on math.

Cassie had used a computer at a job service where clients can "look up jobs." She said, "I like working on the computer. I thought that maybe someday I would like to get a job working with computers but I don't know the typing." We talked about the keyboarding courses available at TLC and she thought someday she might try them.

Cassie worked on the Apple IIe first. She found it easier to learn than the CCC computer, "Mostly because the CCC has things you have to punch, more steps to learn how to operate it." She also thought the CCC computer " does not give you enough time."

A strength of TLC for her was , "The staff, they're good at helping you." She thought TLC needed to hire more personnel. "Sometimes I come and it is overcrowded--otherwise I like it."

Cassie found TLC different from school: "You can work at your own pace. The teachers take more time to explain things. If you don't understand, they take time to explain it so you do understand."

Cassie thinks TLC is having an impact. She reported, "I can comprehend better now. Before I used to read something and wondered what it all meant. Now I can read it and understand what it means. " She said that learning math "is a little slower. I know my multiplication facts, but I put numbers in the wrong place. The computer shows you where the numbers should go and if you do it wrong it tells you why."

When asked for additional comments, Cassie said, "I hope they keep this going. I feel good everytime I go out, like I'm accomplishing something myself."